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NOTE.—The positions of these soundings have already been published, in the List of Oceanic Depths and Serial Temperature Observations, received at the Admiralty during the year 1899.

REPORT

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ON

SOUNDING CRUISE

OF

H.M.S. "EGERIA"

(Commander Morris H. Smyth)

ON

THE PROPOSED PACIFIC CABLE ROUTE,

BY

Lieutenant Boyle T. Somerville, R.N.

N. PACIFIC OCEAN,

1899.

HYDROGRAPHIC DEPARTMENT,
ADMIRALTY,
JUNE 1900.

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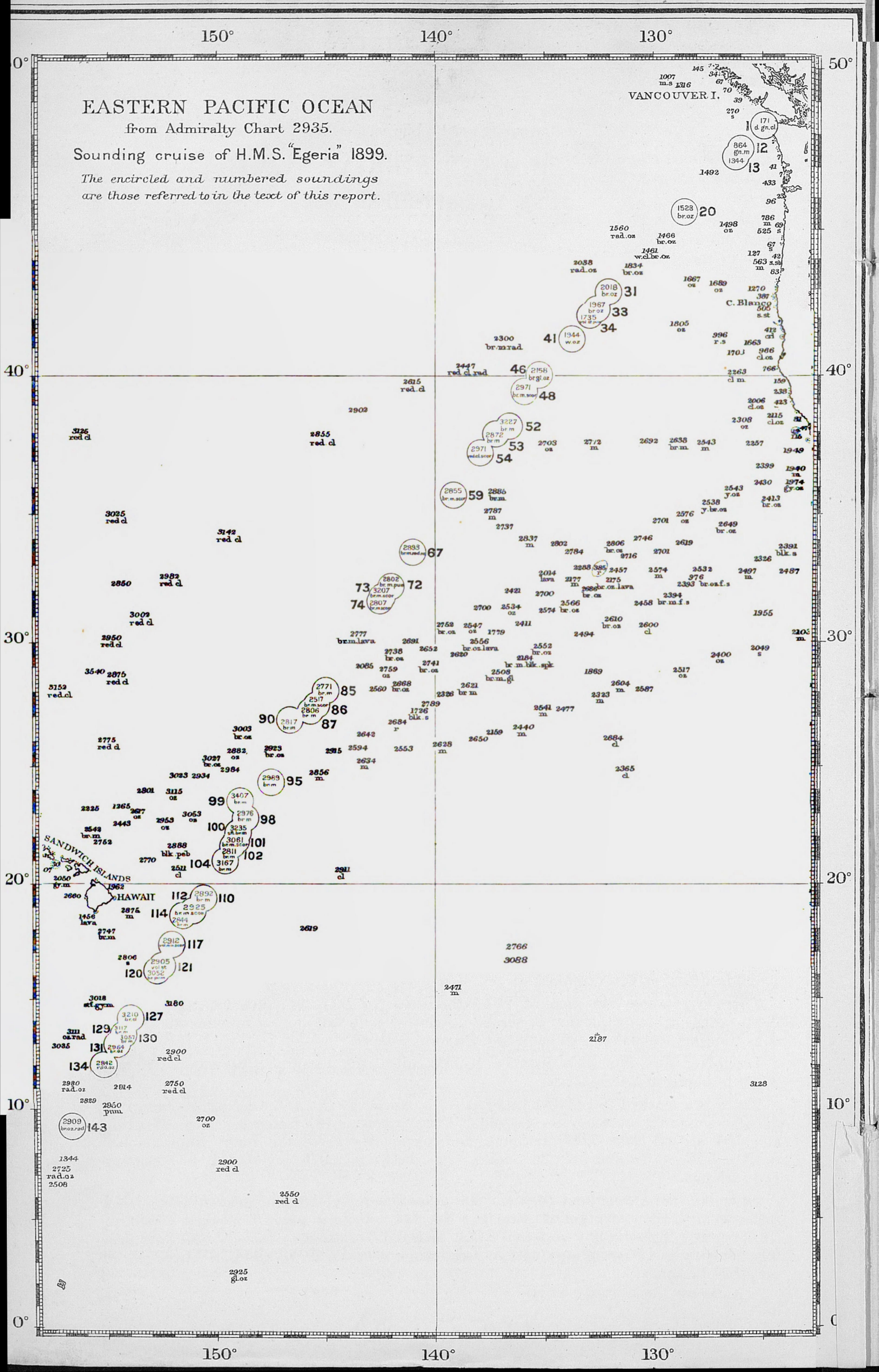
EASTERN PACIFIC OCEAN
from Admiralty Chart 2935.
Sounding cruise of H.M.S. "Egeria" 1899.
The encircled and numbered soundings are those referred to in the text of this report.
VANCOUVER I.
C. Blanco
SANDWICH ISLANDS
HAWAII
150°
140°
130°
50°
40°
30°
20°
10°
0°

H.M.S. "EGERIA."

JUNE TO SEPTEMBER 1899.

GENERAL REPORT on the SOUNDINGS, DEPOSITS, and BOTTOM TEMPERATURES obtained on the projected PACIFIC CABLE ROUTE, between Lat. 48° 18′ N., Long. 124° 58′ W., and Lat. 9° 07′ N., Long. 156° 36′ W. SEE CHART FOR NUMBERED POSITIONS.

From the point of departure in Lat. 48° 18′ N., Long. 124° 58′ W., the depths gradually and evenly increased to the 1,000 fathom line, in about Lat. 47° 25′ N., Long. 126° 15′ W., except in one locality, where a ridge lying parallel to the coast, and 15 to 25 miles distant from it, was crossed with two soundings of 64 and 66 fathoms, having 170 fathoms on either side of them.

The increase from 1,000 to 2,000 fathoms was also steady; the latter depth being reached at No. 31 sounding in Lat. 42° 50′ N., Long. 132° 04′ W.

At No. 34 sounding there was a marked rise of 232 fathoms, followed at the next sounding by a fall of 314 fathoms. Additional soundings were accordingly obtained in the vicinity at 5 to 10 miles radius round No. 34, which resulted in a depth of 1,587 fathoms being obtained about 10 miles to the eastward, the remainder all at a depth of about 2,000 fathoms.

From this point the depths slowly increased until 2,900 fathoms was reached at No. 53 in Lat. 36° 56′ N., Long. 137° 10′ W.

This position being a favourable one from which to sail to San Francisco, course was shaped in that direction; and on the ship's return, completed with coal, the line was resumed at No. 54, 60 miles further along the projected line; the intervening distance having been sounded by the United States Government surveying vessels.

The soundings from this point to the end of the line preserve a very even character, the greatest depth, at No. 99, being 3,407 fathoms; and the least depth, at No. 86, being 2,517 fathoms; a range of but 890 fathoms in 2,095 miles, the maximum and minimum occurring only 220 miles apart.

The line of soundings taken by H.M.S. "Egeria" was broken in several places where soundings had previously been obtained; the depths in such positions, however, fall within the limits above given, and the same remark refers to each of the divisions mentioned hereafter.

Between No. 54 and No. 72, a distance of 360 miles, the range is between 2,997 and 2,817 fathoms, or 180 fathoms.

No. 73 shows a rise of 405 fathoms from the previous sounding, and then an equally sudden fall of 400 fathoms to the next sounding, No. 74.

From No. 74 to No. 85, a distance of 255 miles, the range lies between 2,838 and 2,622 fathoms, or 216 fathoms.

There is a sudden rise here of 254 fathoms to No. 86 (2,517 fathoms), the shoalest depth in the southern portion of the line, followed by a fall of 289 fathoms at No. 87; thus bringing the soundings back to the average depth.

From No. 87 to No. 98, a distance of 300 miles, the range lies between 2,740 and 2,989 fathoms, or 249 fathoms.

There is a marked fall of 431 fathoms from No. 98 to No. 99, this latter being the deepest sounding obtained in the whole line, namely, 3,407 fathoms. Nos. 100, 101, and 104 are all over 3,000 fathoms, and, except for these, the range from No. 102 to No. 120, a distance of 360 miles, lies between 2,975 and 2,811 fathoms, or 164 fathoms.

After No. 121 throughout the next 200 miles the depths are all greater than 3,000 fathoms, with the exception of sounding No. 131, which is only 36 fathoms less than that depth. They range between 3,052 and 3,337 fathoms; that is 285 fathoms. The remaining 11 soundings of the line range between 2,789 and 2,917 fathoms, or only 128 fathoms.

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Character of Bottom Specimens.

The deposits up to the 1,000 fathom line were of a dark green colour and of varying consistency; at first clay, then, when passing over the ridge at Nos. 3 and 4 soundings, clay combined with coarse sand.

At No. 6, 256 fathoms, the only specimen recovered consisted of a few small black stones, apparently of volcanic origin.

After this, up to the 1,000 fathom line, which occurs between Nos. 12 and 13, the consistency was soft, generally mud in two layers of differing densities, but occasionally the lower layer was of a greyish clay.

Between the 1,000 and 2,000 fathom line, Nos. 13 to 33, a distance of 400 miles, it was for the most part in two layers of differing colours and densities; the upper, a soft brown ooze, five or six inches deep, and the lower, grey clay of a stiffer consistency; the former generally contained radiolaria and globigerinæ, or both.

At No. 34, mentioned above as being shoaler than adjacent soundings, and which occurs near the 2,000 fathom line, the bottom specimen was typically volcanic in nature, the deeper soundings adjacent all being moderately soft brown ooze, containing foraminifera and radiolaria.

This was the general character up to No. 48, a distance of 280 miles, with the single exception of No. 41, which was of light yellowish colour, and was almost entirely composed of foraminifera.

At No. 48 the ooze became very soft, the tube (a Baillie) being constantly completely filled with the specimen; considerable difficulty was, in consequence, experienced in causing the sinkers to slip. This material is composed of very fine brown particles, the small residue left after washing being of an entirely volcanic nature. This condition continued for 100 miles, namely, to No. 53 sounding, Lat. 37° 57′ N., Long. 137° 10′ W.

The general character of the bottom from No. 54 to No. 131, the end of the first line, a distance of 1,095 miles, was marked by a great sameness. The colour was brown throughout, and in the largest majority of specimens the substance was mud of different degrees of softness, interspersed with siliceous organisms, chiefly radiolaria and sponge spicules; scoriæ were present in many instances.

It may be generally said that neither globigerinæ nor other foraminifera were found between the 46th and 131st soundings (*i.e.*, between Lat. 40° 00′ and 12° 57′ N.), with the exception of the red cast mentioned at No. 95, which closely resembled one figured on Plate XXIV, Fig. 3, in the "Challenger" report.

From No. 54 to No. 59 the bottom was of a moderate density, and the specimen usually four to five inches deep in the tube. Between Nos. 100 and 114 it was very much softer, filling the tube to the depth of seven to eleven inches at the first drop.

At the sounding No. 114 the character in this respect completely changed, and became dry, friable, and stiff like clay (though chiefly composed of pumice); only a small amount being brought up in the tube. A "Driver" rod was then used, and larger specimens obtained, but of the same nature, up to No. 127, when the character again entirely altered, and for three soundings was of very soft mud, completely filling the tube.

At No. 131 it was not quite so soft, and provided a fine specimen of radiolarian ooze with, for the first time since No. 46, a few globigerinæ.

A more or less markedly volcanic region began at No. 90 sounding, in Lat. 25° 60′ N., Long. 146° 36′ W. (though occasional volcanic specimens were recovered before that position), and continued without real intermission to the end of the line.

The remarks accompanying each individual sounding sufficiently point out the slight differences in the constitution of the heavier washings, throughout the whole series.

System employed in the Microscopic Examination, and Remarks.

The system of washing out the specimens was that recommended in the "Challenger" report, namely, by shaking up in a bottle with several renewals of fresh water. The finer washings thus produced settled rapidly in the vessel into which they were poured, and usually consisted of a dull brown material of an argillaceous nature in very minute particles.

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Considerable difficulty was, as a rule, found in separating this deposit from the heavier particles; and there were, even after most lengthy washings, some concretions of this brown matter accompanying the latter, but separated from them.

The residue after washing bore, as a rule, but a very small proportion to the whole amount washed; a piece of the original mud weighing three or four ounces would commonly only produce a group of specks that could easily be covered by a sixpence; and it is the character of these that has been reported on in the accompanying remarks to the list of soundings.

In many places the character of the bottom was decidedly of volcanic origin, and the heavier washings were then much greater in amount, in a few cases being more, even than the light washings.

It should be noted here, that the specimens sent home have always been placed in the bottles with the lower layers at the bottom; thus exhibiting the specimen exactly as it was recovered.

Bottom Temperature.

The bottom temperatures were taken after the depth of 1,500 fathoms was obtained, *i.e.*, at No. 20 sounding; and from there to No. 41 (1,944 fathoms) it remained between 34°·8 and 35°·0 Fahrenheit.

At the latter sounding it became 35°·2, and continued so up to No. 52, when it rose to 35°·5, and there remained to No. 66 sounding.

At No. 67 it fell to 34°·8, and for the following four soundings it was either at that reading or at 34°·5; without, however, any difference taking place in the average depths of the soundings.

At No. 72, and as far as No. 110 sounding, the bottom temperature was almost continuously the same, namely, 35°·5; with a tendency to fall to 35°·2 near the last-mentioned position.

At No. 112 it somewhat suddenly fell to 34°·2, the depth being 2,925 fathoms, the usual even depth of this region. At No. 117 (2,912 fathoms) the lowest temperature of the line occurred, *i.e.*, 33°·8, and this area of low temperature continued to No. 121, when it again rose to 35°·3, while the soundings were all unusually deep (over 3,000 fathoms); it thence gradually rose to 36°·0 at No. 129 and 130, which was the highest bottom temperature recorded on the cruise.

At No. 134 it had fallen again to 34°·5; and this degree was maintained with but slight variation up to No. 143, in Lat. 9° 07′, the end of the line.

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NORTH PACIFIC OCEAN.

DEEP SEA SOUNDINGS OBTAINED BY H.M.S. "EGERIA." JUNE 1899.

Date.	No. of Sounding.	Latitude. N.	Longitude. W.	Depth. Fms.	Nature of Bottom.	Surface Temp. degrees Fah.	Bottom Temp. degrees Fah.	Remarks.
		° ′	° ′			°	°	
1899.					Soundings from C. Flattery on proposed Pacific Cable Route.			
19 June	1	48.18·2	124.58·1	171	d. gn. cl.	—	—	
„	2	48.17·8	124.59·1	172	„	—	—	
„	3	48.14·3	125.04·0	64	d. gn. m. c. sh. s.	—	—	
„	4	48.10·7	125.09·0	66	s. m.	—	—	
„	5	48.07·4	125.13·0	167	c. s. m.	—	—	
„	6	48.03·3	125.17·2	256	st.	—	—	Very small specimen of black stones.
„	7	47.59·1	125.22·5	309	sft. d. gn. m.	—	—	Lower layer of specimen slightly denser than upper.
„	8	47.55·0	125.28·1	381	„ „	—	—	Similar specimen to No. 7.
„	9	47.51·5	125.34·2	525	sft. d. gn. m. st.	—	—	Similar to No. 7, but containing stones from ¾ in. in length downwards.
„	10	47.48·5	125.39·7	540	gn. m. gy. cl.	—	—	Specimen in two layers, the lower being grey clay.
„	11	47.45·0	125.44·7	579	gn. m.	—	—	
„	12	47.33·7	126.00·9	864	sft. gn. m.	—	—	
20 „	13	47.20·7	126.19·3	1344	none obtained.	—	—	Wire parted on heaving in; lost 1,322 fms. wire and deep-sea thermometer No. 1 and tube; lost 4 fms. of wire and tube.
„	14	47.07·0	126.38·2	1400	„ „	—	—	
„	15	46.53·5	126.57·6	1443	gy. cl. br. oz.	—	—	
„	16	46.39·5	127.19·0	1477	„ „	—	—	
21 „	17	46.22·5	127.44·0	1506	„ „	—	—	Upper layer of specimen brown ooze 6 ins. in tube. Lower layer of specimen grey clay 2 ins. in tube.
„	18	46.17·8	128.05·5	1543	„ „	—	—	Similar to No. 17; a few globigerinæ washings.
„	19	45.53·1	128.21·3	1526	„ „	—	—	Contains a fair number of radiolaria and globigerinæ. The grey clay has a larger quantity than the brown ooze.
„	20	45.38·2	128.37·3	1523	gy. cl. sft. br. oz.	53·0	34·8	Small amount of clay; ooze very soft; radiolaria in great quantity. Whole specimen 6 ins. deep in tube.
22 „	21	45.08·4	129.08·2	1519	„ „	54·5	35·0	Ditto ditto.
„	22	44.53·6	129.24·0	1466	br. foram. oz.	54·5	35·0	Foraminifera abundant.
„	23	44.39·5	129.43·9	1527	br. cl. d. br. oz.	55·5	35·0	Two marked layers; the upper, brown ooze, much darker colour than yet obtained.
23 „	24	44.26·2	130.05·4	1461	wh. cl. br. oz.	55·0	35·0	A smaller layer of the lower layer, of a greenish white colour, nearly as soft as the overlying ooze.
„	25	44.13·2	130.27·0	1330	none obtained.	55·0	—	
„	26	44.06·5	130.37·5	1650	br. glob. oz. cl.	55·5	35·0	Upper layer of ooze contains many radiolaria; the lower layer almost entirely globigerina.
„	27	43.51·3	130.55·2	1834	br. oz.	56·0	34·8	Both layers contain globigerinæ and radiolaria.
24 „	28	43.36·3	131.12·6	1877	gy. cl. br. oz.	57·0	34·8	Upper layer radiolaria; the lower layer very few. Globigerinæ almost absent.
„	29	43.22·6	131.28·7	1910	br. oz. cl.	57·0	34·8	Similar to No. 28, but not so large a percentage of radiolaria.
„	30	43.07·6	131.46·0	1976	br. rad. oz. cl.	58·0	34·8	Similar to No. 29, but a larger number of radiolaria. Foraminifera almost absent.
„	31	42.50·6	132.04·0	2018	gy. cl. br. oz.	58·0	34·8	
25 „	32	42.35·1	132.19 2	2017	br. glob oz.	—	—	Washings consist almost entirely of globigerinæ.
„	33	42.17·9	132.36·7	1967	br. oz.	58·0	34·8	Very small specimen; not enough to retain.

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DEEP SEA SOUNDINGS OBTAINED BY H.M.S. "EGERIA," JUNE AND JULY 1899—*continued.*

Date.	No. of Sounding.	Latitude. N.	Longitude. W.	Depth. Fms.	Nature of Bottom.	Surface Temp. degrees Fah.	Bottom Temp. degrees Fah.	Remarks.
1899.		° ′	° ′			°	°	
25 June	34	42.02·8	132.52·7	1735	vol. st. pum.	58·0	—	Typical volcanic formation; hardly a trace of organic formations.
26 „	35	41.44·5	133.09·3	2049	br. foram. oz.	—	—	Upper layer many formaniferous shells; lower slate and a few radiolaria.
„	36	42.04·9	132.43·0	1587	none obtained.	—	—	Wire parted heaving in; lost 396 fms., one tube, and thermometer.
„	37	42.10·8	132.41·0	2113	br. oz.	—	—	
„	38	42.08·7	132.50·4	1992	br. oz. cl.	—	—	
27 „	39	41.57·0	133.03·4	2142	„	—	—	
„	40	41.34·0	133.28·6	2067	br. foram. oz. cl.	59·5	35·0	Both layers contain a large percentage of foraminiferous shells. The lower layer is of lighter brown than the upper.
„	41	41.19·8	133.44·4	1944	w. foram. oz.	59·5	35·0	Two layers, upper of a yellowish, lower of a pinkish, white, both almost entirely foraminiferous shells.
„	42	41.01·8	134.01·4	2217	br. oz.	59·5	35·2	Washings contain globigerinæ and radiolaria, the lower layer having the higher percentage.
28 „	43	40.47·0	134.17·8	2292	none obtained.	—	—	Wire parted attempting to detach weights; lost 2,275 fms., tube, and thermometer.
„	44	40.31·6	134.35·1	2273	„ „	—	—	Wire parted on heaving in; lost 2,126 fms., tube, and thermometer.
„	45	40.15·2	134.53·6	2391	br. oz. scoriæ.	61·0	35·2	Two layers nearly same colour, about 85 per cent. of fine washings; residue a few small scoriæ.
„	46	40.00·4	135.12·1	2158	br. gl. oz.	60·0	35·0	Two layers, the lower of a lighter colour than the upper. Both washings have a high percentage of globigerinæ.
29 „	47	39.45·0	135.32·7	2437	none obtained.	60·0	34·8	Specimen washed out of tube.
„	48	39.29·6	135.51·3	2971	br. m. vol. part. scor.	61·5	35·2	Specimen 7 ins. deep in tube; two layers of nearly the same colour. Washings were largely of volcanic origin.
„	49	39.11·5	136.11·0	2706	„ „	62·5	35·2	No organic forms present. A few small particles of yellow metallic substance.
„	50	38.49·5	136.24·0	2741	none obtained.	—	—	Wire parted at splice; lost 2,285 fms., one thermometer, one tube.
30 „	51	38.31·6	136.38·6	2635	sft. br. m. scor.	62·5	34·7	Bottom very soft. 95 per cent. of fine washings. No trace of organic forms.
„	52	38.13·2	136.55·2	3227	sft. br. m. vol. part scor.	63·0	35·5	Same as at 51. Tube completely filled. Scoriæ ¼ to ½ in. in length. A few volcanic particles in washings.
1 July	53	37.56·8	137.10·5	2872	sft. br. m. vol. part scoriæ.	63·5	35·5	Similar to No. 52. 30 minutes occupied in releasing sinkers. Scoriæ all very small.
21 „	54	37.07·0	137.57·5	2971	red. cl. scor.	—	—	Mineral particles and small scoriæ. No organic forms present.
22 „	55	36.50·2	138.15·5	2932	red. cl. scor.	65·5	35·5	Similar to No. 54, but of lighter colour.
„	56	36.34·8	138.31·5	2852	none recovered	67·5	35·5	Tube clean and undented.
„	57	36.15·0	138.45·0	2817	br. m. scor.	67·0	35·5	Chiefly fine washings. A few scoriæ in heavier washings.
23 „	58	35·54·6	138.57·0	2857	vol. part. br. m. rad. oz.	67·0	35·2	Specimen 3 in. deep in tube, chiefly fine washings. A few radiolaria, sponge spicules, and volcanic particles in remainder.
„	59	35.37·8	139.09·2	2855	br. m. scor.	68·5	35·2	Similar to last. Sponge spicules and scoriæ in considerable quantities.
„	60	35.23·2	139.21·9	2997	„	68·0	35·5	Specimen chiefly fine washings; the remainder contain a few siliceous remains and scoriæ, but consist chiefly of dull brown crystalline fragments.
24 „	61	35.08·2	139.34·7	2962	br. m.	67·5	35·5	Similar to 60, but with a larger quantity of siliceous organisms.
„	62	34.52·2	139.48·5	2923	„	68·0	35·5	Similar to 60.
„	63	34.35·7	140.02·8	2904	„	68·5	35·5	Ditto.
25 „	64	34.18·8	140.17·6	2937	br. m. scor.	68·0	35·5	Washings consisted of siliceous remains. A few small scoriæ, with irregular crystalline fragments of various colours.
„	65	34.01·7	140.32·1	2944	br. m. rad. oz.	68·5	35·5	Considerable difficulty experienced in separating fine washings from remainder, which contained several radiolaria and a laminated white crystal. No scoriæ.
„	66	33.45·5	140.45·9	2852	br. m. rad. oz.	69·5	34·5	Similar to 65. Marked change in bottom temp.

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NORTH PACIFIC OCEAN.

DEEP SEA SOUNDINGS OBTAINED BY H.M.S. "EGERIA," JULY AND AUGUST 1899—*continued.*

Date.	No. of Sounding.	Latitude. N.	Longitude. W.	Depth. Fms.	Nature of Bottom.	Surface Temp. degrees Fah.	Bottom Temp. degrees Fah.	Remarks.
1899.		° ′	° ′			°	°	
26 July	67	33.30·2	140.59·8	2893	br. m. rad. oz.	68·5	34·8	Specimen 8 ins. deep in tube. Similar to 65.
„	68	33.15·0	141.13·6	2889	„	69·0	34·5	Specimen 4 ins. deep in tube. Very few radiolaria. Many sponge spicules and a yellow laminated crystal in heavy washings.
„	69	32.57·8	141.24·3	2837	br. m. sponge spicules	69·5	34·5	No radiolaria. Sponge spicules fewer. Brown particles of larger size than hitherto seen.
„	70	32.39·8	141.37·6	2873	„ „	68·5	34·5	Similar to 69.
27 „	71	32.22·8	141.50·5	2745	w. pum. scor. br. m.	69·0	34·8	Specimen 8 ins. deep in tube after 2nd dropping, similar to other brown muds, but contains a larger number of siliceous remains. A few scoriæ present and a large piece of white pumice in deposit.
„	72	32.05·5	142.03·4	2802	br. m. pum.	69·8	35·3	Similar to 71. Marked change in bottom temperature.
„	73	31.48·5	142.16·4	3207	br. m. scor.	69·0	35·2	A very small residue.
28 „	74	31.31·3	142.29·4	2807	„	68·5	35·2	A very small residue, consisting of siliceous remains and a few scoriæ.
„	75	31.13·6	142.42·8	2714	br. m.	69·0	35·2	A very small specimen.
„	76	30.58·0	142.55·9	2622	none recovered	69·0	35·5	Tube clean and undented.
29 „	77	30.43·5	143.08·3	2793	br. m. vol.	69·5	35·2	Washings composed almost entirely of volcanic products, with several pieces of black substance resembling cinders, ¼ to ½ in. in diameter. Practically no siliceous remains.
„	78	30.28·7	143.21·0	2835	br. m.	70·0	35·5	Heavy washings, composed almost entirely of sponge spicules, with a few radiolaria. Two examples of yellow foraminifera and few scoriæ.
„	79	30.13·5	143.33·5	2777	br. m. lava	70·0	35·5	Heavy washings, chiefly argillaceous matter, with a few sponge spicules. An oval pebble of lava, one inch in length, came up in deposit.
„	80	29.58·0	143.45·3	2838	br. m. sponge	70·0	35·5	Many sponge spicules and several small fishes teeth in heavy washings. No scoriæ.
30 „	81	29.42·0	143.58·3	2722	br. m. vol.	70·2	35·5	Washings consisted of very small volcanic crystals, scoriæ, and a few sponge spicules.
„	82	29.27·0	144.10·3	2780	br. m. scor.	70·5	35·5	Heavy washings, consisting entirely of volcanic products, scoriæ. Mineral particles, with several large pieces of lava and cinders, discoloured yellow in parts.
„	83	29.08·9	144.19·0	2807	br. m.	70·2	35·5	Deposit consisted of brown argillaceous matter, with a few siliceous remains.
31 „	84	28.52·5	144.28·8	2712	br. m. vol. scor.	70·5	35·5	Heavy washings consisted almost entirely of volcanic crystals of various colours. A few small scoriæ, one ½ in. in diameter. A few sponge spicules.
„	85	28.06·4	144.59·6	2771	br. m.	71·6	35·5	Brown argillaceous matter, with a few sponge spicules.
„	86	27.27·8	145.29·2	2517	br. m. vol. scor.	72·0	35·5	Heavy washings consisted entirely of volcanic crystals of various colours and scoriæ, several of the latter very large.
„	87	27.10·8	145.41·2	2806	br. m. min. part.	72·0	35·5	Heavy washings, chiefly composed of white crystalline matter in fine particles, with a few sponge spicules and scoriæ.
1 Aug.	88	26.53·7	145.53·8	2800	br. m. rad. oz.	72·5	35·5	Brown argillaceous matter, with several radiolaria, some of unusually large dimensions, with a few sponge spicules. No scoriæ.
„	89	26.08·0	146.25·3	2740	br. m. scor.	74·0	35·2	Brown argillaceous matter, interspersed with small white crystals, a few scoriæ and siliceous remains.
„	90	25.50·1	146.36·5	2817	br. m. vol.	73·5	35·5	Heavy washings consisted chiefly of volcanic crystals, pieces of an opaque yellow substance, probably palagomite, and scoriæ. Several small fishes' teeth, and siliceous remains.
2 „	91	25.32·4	146.47·7	2889	br. m. vol.	74·0	35·5	Small volcanic crystals, pieces of opaque white pumice and small scoriæ. Several varieties of radiolaria and sponge spicules.

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DEEP SEA SOUNDINGS OBTAINED BY H.M.S. "EGERIA," AUGUST 1899—*continued.*

Date.	No. of Sounding.	Latitude. N.	Longitude. W.	Depth. Fms.	Nature of Bottom.	Surface Temp. degrees Fah.	Bottom Temp. degrees Fah.	Remarks.
1899.		° ′	° ′			°	°	
2 Aug.	92	25.14·4	146.58·8	2938	br. m. vol.	74·0	35·5	Volcanic crystals of various colours, pumice and a few pieces of palagonite, with a small percentage of siliceous remains.
„	93	24.54·9	147.11·1	2901	br. m.	74·5	35·5	Small white crystals, scoriæ, and pumice, with a few sponge spicules, not in any large quantity.
„	94	24.38·7	147.23·7	2924	br. m. pum.	75·0	35·5	Small white crystals, scoriæ and pumice, with a few large sponge spicules in heavy washings, but not in a large quantity.
„	95	24.21·5	147.35·5	2989	„	74·0	35·5	Similar to No. 84 deposit, with small volcanic crystals in addition. One very perfect red cast of a foraminiferous organism in the washings examined.
3 „	96	23.22·8	148.13·0	2957	br. m.	78·7	35·5	Brown argillaceous matter interspersed with siliceous organisms and some pumice, also a few small scoriæ.
„	97	23.05·5	148.25·1	2747	br. m. pum. scoriæ.	74·0	35·2	Heavy washings composed of white pumice. Scoriæ in considerable quantities, with several varieties of radiolaria and other siliceous forms. A piece of lava ½ in. in diameter in the deposit.
4 „	98	22.47·8	148.37·6	2976	br. m. lava.	74·0	35·5	Brown argillaceous matter in rounded granules, with a few sponge spicules. A piece of lava 1 in. × ½ in. in the deposit.
„	99	23.30·3	148.50·4	3407	sft. br. m. vol. scor.	74·0	35·5	Specimen very soft, in three layers of different consistencies, lowest being the lightest in colour, 9 inches deep in tube at first drop. Argillaceous matter, scoriæ, volcanic crystals, and laminæ with an iridescent surface. A fair percentage of radiolaria.
„	100	22.13·4	149.02·6	3235	soft. br. m.	74·0	35·5	Similar to last specimen, 7 ins. deep in tube. No radiolaria.
„	101	21.54·8	149.08·6	3061	soft. br. m. scor. rad.	75·0	35·5	Washings largely composed of scoriæ with volcanic crystals and a high percentage of radiolaria of several varieties.
„	102	21.37·5	149.17·6	2811	soft. br. m. scor. pum.	74·5	35·2	Specimen 7 ins. deep in tube. Washings naturally divided into two nearly equal parts; one yellowish of pumice, the other heavier minute black volcanic scoriæ, interspersed with crystals of various colours, chiefly white with a few radiolaria.
5 „	103	21.21·0	149.26·7	2871	br. m. scor. pum.	74·0	35·2	Specimen 5 ins. deep in tube, in all respects similar to No. 102.
„	104	21.02·7	149.35·5	3167	„ „	74·5	35·5	Bottom layers of specimen of a darker colour and closer consistency than upper. Washing similar to 102, but with a larger number of radiolaria.
„	105	20.50·4	149.52·7	2917	d. br. cl. vol.	75·5	35·2	Very small specimen in tube.
„	106	20.34·0	150.04·5	2847	sft. br. m. vol.	75·5	35·5	Specimen 11 ins. deep in tube with one drop to bottom. Washings composed of heavy black volcanic particles, pumice, and a fair percentage of radiolaria.
6 „	107	20.17·7	150 16·4	2915	sf. br. m. vol. rad.	76·0	35·2	Washings, half-brown argillaceous matter, half heavy volcanic particles and crystals with a large number of radiolaria of various varieties.
„	108	20.01·2	150.28·1	2885	br. m. vol.	75·5	35·2	Washings similar to last specimen, but with siliceous organisms nearly absent.
„	109	19.42·0	150.34·4	2964	br. m. min. part.	77·0	35·5	Washings of quite a different character to foregoing; composed of minute crystals and irregular colourless laminæ, also many pieces of an iridescent nacrous shell, a few radiolaria, and several specimens of a concave circular white shell of appreciable size.
„	110	19.25·1	150.34·4	2892	br. m. vol.	77·0	35·5	Brown argillaceous matter with an equal amount of heavier black volcanic particles and crystals, some of pale blue colour. A few radiolaria.
7 „	111	19.06·4	150.54·1	2975	none recovered.	—	—	Wire parted whilst heaving in; lost tube and thermometer, and 24 fathoms of wire.
„	112	18.47·7	151.04·4	2925	br. m. scor.	76·5	34·2	Tube completely filled with deposits after several drops to disengage sinkers. Brown argillaceous matter with an equal quantity of grey scoriæ and a few volcanic crystals. No siliceous remains. Marked change in bottom temperature.

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DEEP SEA SOUNDINGS OBTAINED BY H.M.S "EGERIA," AUGUST AND SEPTEMBER 1899—*continued.*

Date.	No. of Sounding.	Latitude. N.	Longitude. W.	Depth. Fms.	Nature of Bottom.	Surface Temp. degrees Fah.	Bottom Temp. degrees Fah.	Remarks.
1899.		° ′	° ′			°	°	
7 Aug.	113	18.30·2	151.14·2	2941	br. m. scor.	76·7	34·2	Exactly similar to No. 112.
„	114	18.38·8	151.31·0	2844	„	77·0	34·0	Very similar to 112. The brown matter is formed in somewhat larger concretions.
„	115	17.57·2	151.41·4	2831	vol. m. scor.	77·0	34·0	A small specimen recovered. Volcanic mud and ashes in equal quantities, interspersed with a few blue and yellowish crystals.
„	116	17 39·5	151.53·5	2872	none recovered.	—	—	Wire parted, splice passing over dial wheel; lost 1,987 fathoms of wire, tube and thermometer.
„	117	17.21·8	152.05·0	2912	vol. min. scor.	77·0	33·8	A small specimen, composed of volcanic crystals of small and varying size, fine scoriæ with a few radiolaria, some slightly discoloured.
8 „	118	17.03·2	152.10·5	2914	no deposit.	77·5	34·7	Tube came up quite clear, undented. Marked rise in bottom temperature.
„	119	16.47·2	152.20·3	2927	vol.	78·0	35·0	A very small specimen adhering to bottom of tube. Not sufficient to retain.
9 „	120	16.28·6	152.32·0	2905	vol. st.	78·0	34·7	A very small specimen of small volcanic stones.
„	121	16.10·6	152.43·2	3052	br. pum. vol. cl.	77·5	35·3	An upper and lower layer: upper, brown clayey matter, with volcanic particles and crystals; lower layer similar, but with a large quantity of pumice in pieces of considerable size. Siliceous remains almost absent. Hardly any fine washings.
„	122	15.34·3	153.04·2	3093	br. m. pum.	78·5	35·5	Two layers—upper soft, lower dry and compact, like clay; whole specimen 4 ins. deep. Both layers appear to be composed of pumice in dust and granules, within the upper layer a large percentage of volcanic crystals and scoriæ. No siliceous remains. Considerable difficulty experienced in separating the crystalline from the remaining particles.
„	123	15.18·0	153.13·2	3189	„	77·5	35·3	Specimen similar in every way to 122.
10 „	124	15.00·5	153.22·1	3172	„	77·0	35·3	Similar to 122, but upper layer 1 in. deep; the lower very dry and friable, 4 ins. deep. Mineral particles almost absent.
„	125	14.43·3	153.31·0	3079	br. cl. pum.	78·8	35·7	A small specimen in one layer of clay only, about 2 ins. deep, similar to the lower layers of 122. No mineral particles.
„	126	14.27·0	153.43·6	3127	br. m. pum.	79·5	35·3	Specimen similar in every way to the last.
„	127	14.07·2	153.54·5	3210	br. cl. min.	79·0	35·3	A very small specimen adhering to the bottom of the tube; not sufficient to retain; somewhat similar to immediately preceding deposits, but with the addition of very minute mineral particles.
„	128	13.50·2	154.04·9	3337	br. cl. pum.	78·5	35·3	A small specimen, very dry, friable, almost entirely composed of pumice in fine dust, and also in rounded fragments.
11 „	129	13.33·4	154.15·4	3117	soft br. m. pum.	79·0	36·0	Complete change in external character of specimen. Tube completely filled first drop, and sunk so deeply it was extricated with difficulty. Two layers—upper, minute volcanic crystals and scoriæ; lower, altogether pumice, with a few radiolaria. A marked rise in the bottom temperature.
„	130	13.17·7	154.26·2	3057	„	79·3	36·0	Similar to last specimen; tube again completely filled. No heavy remains in upper layer; all went off in fine washings. Lower consists chiefly of pumice, with a few radiolaria.
„	131	12.57·7	154.33·0	2964	br. oz. rad. pum.	80·0	35·7	Specimen not quite so large in quantity as the two preceding, but still very soft; in two layers — upper, almost altogether pumice; lower, a fine specimen of radiolarian ooze, showing many varieties and a few globigerinæ.
8 Sept.	132	12.41·0	154.42·5	2867	not recovered.	Nil.	Nil.	Wire parted at 810 fms.; lost tube and thermometer.
„	133	12.20·2	154.58·0	2847	„	„	„	Wire parted at a kink immediately above tailing; lost tube and thermometer.
„	134	12.01·7	155.13·5	2842	rad. oz.	„	„	Very small specimen; tube dented; washing almost entirely radiolaria.

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DEEP SEA SOUNDINGS OBTAINED BY H.M.S. "EGERIA," SEPTEMBER 1899—*continued.*

Date.	No. of Sounding.	Latitude. N.	Longitude. W.	Depth. Fms.	Nature of Bottom.	Surface Temp. degrees Fah.	Bottom Temp. degrees Fah.	Remarks.
1899.		° ′	° ′			°	°	
6 Sept.	135	11.34·0	155.20·2	2845	br. rad. glob. oz.	80·0	34·5	Three layers of differing density; washings exhibited fine specimen of radiolaria. Globigerinæ and a large percentage of yellow crystalline substance both in crystals, and appearing as casts of globigerinæ and other forms. A separate bottle of each layer of deposit retained. Scoriæ of all sizes dispersed throughout all layers, but most were found in the uppermost.
„	136	11.11·0	155.32·0	2835	no deposit.	81·2	Nil.	Tube came up clean and undented.
„	137	10.58·0	155.44·2	2842	br. rad. oz. scor.	80·5	35·0	Specimen 8 ins. deep in tube, containing a high percentage of radiolaria with a few globigerinæ interspersed with scoriæ.
„	138	10.41·7	155.56·4	2817	br. rad. glob. oz. scor.	Nil.	Nil.	Deposit small, similar to No. 137, with a larger percentage of globigerinæ.
„	139	10.28·9	155.56·6	2829	„	81·0	34·7	Similar to preceding deposit. A fish's tooth ¼ in. long came up in the tube.
10 „	140	10.07·2	156.05·6	2789	br. calc. oz. lava	82·5	34·5	Fine washings composed of a brown substance, remainder white calcareous remains of many species, with a few interspersed radiolaria. A large piece of lava came up in the deposit.
„	141	9.47·7	156.15·3	2917	br. rad. oz. scor. lava	81·5	34·5	Specimen very similar to 139, but with a larger percentage of scoriæ, and several pieces of lava.
11 „	142	9.32·5	156.23·9	2865	br. rad. oz. pum.	81·5	34·7	A fine specimen of radiolarian ooze, interspersed with pumice in small pieces.
„	143	9.07·3	156.35·7	2909	br. oz. rad.	79·9	34·7	Tube nearly filled with a deposit of brown ooze, streaked with patches of much lighter colour. Considerable percentage of radiolaria interspersed with calcareous remains.
					Soundings on passage from No. 143 Sounding to Honolulu.			
12 „	144	11.08·0	157.00·4	2980	rad. oz.	81·0	34·7	Specimen in two layers, the lower being darker brown than the upper. About 50 per cent. of both consisted of radiolaria. The remainder being fine washings.
13 „	145	12.45·4	157.27·4	2517	mang.	80·5	34·7	Tube contained only one manganese nodule, about 1 in. in length.
14 „	146	14.55·9	157.50·6	3115	pum.	80·0	34·7	A very dry deposit, small in quantity. Hardly any finer washings, the major part consisted of pumice in small pieces.
15 „	147	16.59·6	157.50·0	2797	br. oz. pum.	79·0	34·7	Deposit in two layers differing considerably in consistency though but little in composition. Heavy washings consist of pumice in small pieces, mineral particles, scoriæ, with a few siliceous remains.
16 „	148	18.34·3	157.49·3	2417	sft. br. m. rad.	78·5	34·7	Heavy washings formed about 10 per cent. of the whole specimen, and consisted of radiolaria. Several broken calcareous shells similar to No. 140 specimen, mineral particles, with small scoriæ.
					Soundings on passage from Honolulu to Esquimalt.			
28 „	149	21.13·8	158.10·1	604	crl. m. glob.	Nil		Bottom specimens in two layers, upper half buff colour, lower half slightly greenish hue. Both consist of broken coral interspersed with foraminiferous shells, a few siliceous spicules, and scoriæ. About 10 per cent. of the whole was fine washings.
„	150	21.13·4	158.20·9	1602	gl. oz. min. part.	77·0	35·0	Specimen largely composed of globigerinæ mingled with mineral particles of various colours, and, perhaps, scoriæ. About 10 per cent. was fine washings.
„	151	21.22·5	158.24·8	1307	gy. m.	77·0	35·5	Nearly all deposit was washed out of the tube; not sufficient remaining to retain.
„	152	21.32·0	158.28·2	1100	gl. oz. min. part.	77·0	36·0	*Note.*—Soundings Nos. 149–152, inclusive, were fixed by cross bearings of the land. A fine specimen of globigerinæ, discoloured to a light brown tint, of many species, some of large size, mixed with mineral particles and scoriæ.

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DEEP SEA SOUNDINGS OBTAINED BY H.M.S. "EGERIA," SEPTEMBER AND OCTOBER 1899—*continued.*

Date.	No. of Sounding.	Latitude. N.	Longitude. W.	Depth. Fms.	Nature of Bottom.	Surface Temp. degrees Fah.	Bottom Temp. degrees Fah.	Remarks.
1899.		° ′	° ′			°	′	
28 Sept.	153	23.06·0	158.30·2	2582	red cl.	78·0	35·0	A very small specimen, chiefly consisting of minute crystals and scoriæ, with a very few globigerinæ and radiolaria interspersed, and several worm-shaped casts of a buff-coloured concretion.
30 „	154	24.40·7	158.02·9	2542	„	78·2	35·0	Tube filled to 8 ins. with a specimen similar to 153, with the addition of rounded concretions of a fine light-brown argillaceous substance.
2 Oct.	155	28.01·5	157.21·4	3152	„	76·5	34·8	Specimen of similar consistency to No. 154. Over 80 per cent. was fine washings, the remainder composed of brown argillaceous matter in small ovoid concretions.
4 „	156	30.56·1	153.38·2	3002	„	75·5	35·0	85 per cent. of the specimen was fine washings, the remainder being brown argillaceous concretions, with a few siliceous remains of prunoideans, &c.
5 „	157	32.26·5	152.10·3	2982	„	76·0	35·0	Fine washings formed 95 per cent. of the whole consistency of remainder, being similar to No. 156 sounding, with the addition of some small pieces of manganese.
7 „	158	34.26·1	149.34·3	3142	„	73·7	35·0	95 per cent. fine washings, heavy washings being small brown argillaceous concretions, with a few radiolaria and colourless crystals.
9 „	159	37.53·1	145.21·8	2855	„	70·2	Nil	Precisely the same as No. 158, with the addition of a few scoriæ.
10 „	160	38.49·0	143.41·3	2902	not recovered.	—	—	Wire parted at splice on beginning to heave in. Lost 1,830 fms., tube and thermometer.
12 „	161	39.51·2	141.02·5	2615	red cl.	67·0	34·8	A very small specimen about 75 per cent. of fine washings, the remainder being small light brown argillaceous concretions, with a few globigerinæ and scoriæ interspersed.
13 „	162	40.18·0	138.41·3	2447	rad. oz. scor.	65·0	34·8	About 70 per cent. fine washings, residue composed of equal parts brown argillaceous concretions, radiolaria and scoriæ with several pieces of a fibrous substance resembling wood.
14 „	163	41.17·7	136.49·5	2300	d. br. m. rad.	62·5	34·8	A marked change in colour and consistency from preceding ones. Heavy washing containing 75 per cent. of radiolaria, with small crystals and brown earthy particles.
16 „	164	42.49·5	133.36·1	2090	br. oz. rad.	61·5	34·8	The brown colour of this specimen has a dark greenish tinge. The washings have the same difference of colouring, but appear to be similarly composed to No. 163.
16 „	165	43.58·2	133.09·2	2038	br. rad. oz.	60·0	34·8	The brown colour again tinged with green, but to a less extent. The heavy washings contain a high percentage of radiolaria and several large pieces of algæ.
17 „	166	45.07·2	131.26·2	1560	choc. rad. oz.	58·7	35·2	This specimen is of a very dark brown colour. About 40 per cent. was heavy washings, which consisted of many radiolaria both brown and white, interspersed with white globigerinæ and brown argillaceous particles.

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